

Notice of Allowability

Application No.

10/713,634

Examiner

YAIMA CAMPOS

Applicant(s)

BLEA ET AL.

Art Unit

2185

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/25/2010.
2. ☒ The allowed claim(s) is/are 1-7,9-15,17-23,25-31,38 and 39.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 8/24/10, 10/26/10
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 11/2/10 & 11/4/10
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

/Yaima Campos/
Examiner, Art Unit 2185

DETAILED ACTION

1. As per the instant Application having Application number 10/713,634, the examiner acknowledges the applicant's submission of the amendment dated 8/25/2010. Claims 33-37 and 40-45 have been canceled; and claims 1-32 and 38-39 are pending.

ACKNOWLEDGEMENT OF REFERENCES CITED BY APPLICANT

2. As required by **M.P.E.P. 609(C)**, the applicant's submissions of the Information Disclosure Statements dated 8/24/2010 and 10/26/2010 are acknowledged by the examiner and the cited references have been considered in the examination of the claims now pending. As required by **M.P.E.P 609 C(2)**, a copy of the PTOL-1449 initialed and dated by the examiner is attached to the instant office action.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
4. Authorization for this examiner's amendment was given by Bryan Massey on 11/4/10 on behalf of attorney of record, Brian C. Kunzler (Reg. No. 38,527), as a result of a telephone interview held with attorney of record Brian C. Kunzler on 11/2/2010.
5. The instant application has been amended as follows:

Claims 8, 16, 24 and 32 have been canceled and Claims 1, 9, 17, 25 and 38 have been amended as follows:

Claim 1 (Currently Amended)

An apparatus for automatically selecting a copy function, the apparatus comprising:

an identification module configured to identify one or more available copy functions in response to a data copy request to copy data to a secondary storage device, the identification module identifying each identified copy function by determining that the copy function is available to an application to copy data of the data copy request to the secondary storage device, the secondary storage device comprising one of one or more secondary storage devices available to the application for storing the data;

a comparison module configured to compare ~~one or more~~ copy function attributes of each identified copy function to corresponding copy policy objectives of a predefined copy policy, wherein the copy policy comprises a set of copy policy objectives that correspond to the copy function attributes of each copy function, the copy policy objectives comprising ~~one or more~~ at least two of a recovery point objective, a recovery time objective, a location, a consistency, and an application impact;

a selection module configured to automatically select a copy function that satisfies the predefined copy policy based on the comparison of the copy function attributes to the corresponding objectives of the copy policy; and

a relationship module configured to establish a copy relationship between the selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the requested data to a secondary storage device,

wherein the identification module, the comparison module, the selection module, and the relationship module comprise at least one of hardware and executable code, the executable code executable on a processor and stored on one or more computer readable media;

wherein the comparison module is further configured to calculate a difference between at least two of the copy function attributes, each configured as a numerical value, and corresponding predefined copy policy objectives for each of the available copy functions, to multiply each difference by a priority factor to obtain an adjusted difference, to sum the adjusted differences for each copy function, and the selection module is further configured to select a copy function with a lowest sum of adjusted differences.

Claim 8 (Canceled)

Claim 9 (Currently Amended)

An apparatus for automatically selecting a copy function, the apparatus comprising:

a policy generation module configured to establish a copy policy compatible with an application, the copy policy comprising ~~one or more~~ copy policy objectives, the copy policy objectives comprising ~~one or more~~ **at least two** of a recovery point objective, a recovery time objective, a location, a consistency, and an application impact; and

a copy request module configured to:

recognize a data copy request that included the copy policy;

identify one or more available copy functions in response to a data copy request to copy data to a secondary storage device by determining that each copy function is available to the application to copy data to a secondary storage device of the one or more secondary storage devices, the one or more secondary storage devices available to the application for storing data;

compare copy function attributes of each copy function for a storage device to copy policy objectives of the copy policy, wherein the copy policy comprises a set of copy policy objectives that correspond to the copy function attributes of each copy function;

automatically select a copy function that satisfies the copy policy based on the comparison of the copy function attributes to the corresponding objectives of the copy policy; and

establish a copy relationship between the selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the requested data to a secondary storage device;

wherein the policy generation module and the copy request module comprise at least one of hardware and executable code, the executable code executable on a processor and stored on one or more computer readable media;

wherein comparing attributes of each copy function for a storage device to objectives of the copy policy further comprises calculating a difference between at least two

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of the copy function attributes, each configured as a numerical value, and corresponding copy policy objectives, each configured as a numerical value, for each of the available copy functions, multiplying each difference by a priority factor to obtain an adjusted difference, summing the adjusted differences for each copy function, and automatically selecting a copy function further comprises selecting a copy function with a lowest sum of adjusted differences.

Claim 16 (Canceled)

Claim 17 (Currently Amended)

A system for automatically selecting a copy function, the system comprising:

- a file server comprising

- an application module configured to send a data copy request from an application;

- an identification module configured to identify one or more available copy functions in response to a data copy request to copy data to a secondary storage device, the identification module identifying each copy function by determining that the copy function is available to the application to copy data of the data copy request to the secondary storage device, the secondary storage device comprising one of one or more secondary storage devices available to the application for storing the data;

- a comparison module configured to compare ~~one or more~~ copy function attributes of each available copy function to corresponding copy policy objectives of a

predefined copy policy, wherein the copy policy comprises a set of copy policy objectives that correspond to the copy function attributes of each copy function, the copy policy objectives comprising ~~one or more~~ **at least two** of a recovery point objective, a recovery time objective, a location, a consistency, and an application impact;

a selection module configured to automatically select a copy function that satisfies the predefined copy policy based on the comparison of the copy function attributes to the corresponding objectives of the copy policy;

a relationship module configured to establish a copy relationship between the selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the requested data to a secondary storage device;

wherein the comparison module is further configured to calculate a difference between at least two of the copy function attributes, each configured as a numerical value, and corresponding predefined copy policy objectives for each of the available copy functions, to multiply each difference by a priority factor to obtain an adjusted difference, to sum the adjusted differences for each copy function, and the selection module is further configured to select a copy function with a lowest sum of adjusted differences.

Claim 24 (Canceled)

Claim 25 (Currently Amended)

A method for automatically selecting a copy function, the method comprising:

identifying one or more available copy functions in response to a data copy request that includes a predefined copy policy, the data copy request to copy data to a secondary storage device, the identifying comprising identifying each copy function by determining that the copy function is available to an application to copy data of the data copy request to the secondary storage device, the secondary storage device comprising one of one or more secondary storage devices available to the application for storing the data;

comparing ~~one or more~~ copy function attributes of each available copy function to corresponding copy policy objectives of a predefined copy policy, wherein the copy policy comprises a set of copy policy objectives that correspond to the copy function attributes of each copy function, the copy policy objectives comprising ~~one or more~~ at least two of a recovery point objective, a recovery time objective, a location, a consistency, and an application impact;

automatically selecting a copy function that satisfies the predefined copy policy based on the comparison of the copy function attributes to the corresponding objectives of the copy policy; and

establishing a copy relationship between the selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the requested data to a secondary storage device;

wherein comparing attributes of each available copy function to corresponding objectives of the predefined copy policy further comprises calculating a difference between at least two copy function attributes, each configured as a numerical value, and corresponding predefined copy policy objectives, each configured as a numerical value, for each of the available copy functions, multiplying each difference by a priority factor to

obtain an adjusted difference, summing the adjusted differences for each copy function, and automatically selecting a copy function that satisfies the predefined copy policy further comprises selecting a copy function with a lowest sum of adjusted differences.

Claim 32 (Canceled)

Claim 38 (Currently Amended)

A computer readable storage medium comprising computer readable code configured to carry out a method for automatically selecting a copy function, the method comprising:

identifying one or more available copy functions in response to a data copy request to copy the data that includes a predefined copy policy, the data copy request to copy the data to a secondary storage device, the identifying comprising identifying each copy function by determining that the copy function is compatible with the secondary storage device and available to an application to copy the data to the secondary storage device, the secondary storage device comprising one of one or more secondary storage devices available to the application for storing the data;

comparing ~~one or more~~ copy function attributes of each available copy function to corresponding copy policy objectives of the predefined copy policy, wherein the copy policy comprises a set of copy policy objectives that correspond to the copy function attributes of each copy function, wherein the predefined copy policy objectives within the predefined copy policy comprise a recovery point objective ("RPO"), a recovery time objective ("RTO"), a distance to a secondary site where the secondary storage device is stored, a consistency, and an application

impact, wherein an RPO comprises an amount of data lost over a period of time, wherein an RTO comprises an amount of time to recover data to a usable condition, wherein a consistency comprises a determination of dependency on other stored data, wherein an application impact comprises a performance impact caused by a copy function to the application, the performance impact measured in a unit of time;

automatically selecting a copy function that satisfies the predefined copy policy based on the comparison of the copy function attributes to the corresponding objectives of the copy policy; and

establishing a copy relationship between the selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the requested data to a secondary storage device;

wherein comparing attributes of each available copy function to corresponding objectives of the predefined copy policy further comprises calculating a difference between at least two of the copy function attributes, each configured as a numerical value, and corresponding predefined copy policy objectives, each configured as a numerical value, for each of the available copy functions, multiplying each difference by a priority factor to obtain an adjusted difference, summing the adjusted differences for each copy function, and automatically selecting a copy function that satisfies the predefined copy policy further comprises selecting a copy function with a lowest sum of adjusted differences.

RELEVANT ART CITED BY THE EXAMINER

6. The following prior art made of record and not relied upon is cited to establish the level of skill in the applicant's art and those arts considered reasonably pertinent to applicant's disclosure. See **MPEP 707.05(c)**.

7. The following reference teaches a storage system which provides desired storage attributes for a host computer.

US 2002/0188592

8. The following reference teaches a storage system having a plurality of storage policies and a storage control which interacts with at least one application to determine which storage policy to use for data storage.

US 2001/0034812

9. The following reference teaches a storage manager creating logical devices for data storage that satisfy criteria for the policies appropriate for respective data objects.

US 6,330,621

10. The following reference teaches allocating storage based upon required attributes having assigned priorities.

US 5,287,500

REASONS FOR ALLOWANCE

11. The following is an examiner's statement of reasons for allowance:

12. Per the instant office action, **claims 1-7, 9-15, 17-23, 25-31 and 38-39** (as amended) are considered as allowable subject matter.

The reasons for allowance of claims 1, 9, 17, 25 and 38 (as amended) are that the prior art of record, including the references cited above, neither anticipates, nor renders obvious the recited combinations as a whole.

Regarding claims 1 and 17, the prior art of record, neither anticipates, nor renders obvious the recited combinations of "... a comparison module configured to compare copy function attributes of each identified copy function to corresponding copy policy objectives of a predefined copy policy, wherein the copy policy comprises a set of copy policy objectives that correspond to the copy function attributes of each copy function, the copy policy objectives comprising at least two of a recovery point objective, a recovery time objective, a location, a consistency, and an application impact... wherein the comparison module is further configured to calculate a difference between at least two of the copy function attributes, each configured as a numerical value, and corresponding predefined copy policy objectives for each of the available copy functions, to multiply each difference by a priority factor to obtain an adjusted difference, to sum the adjusted differences for each copy function, and the selection module is further configured to select a copy function with a lowest sum of adjusted differences.", in combination with all the other limitations in independent claims 1 and 17.

Regarding claim 9, the prior art of record, neither anticipates, nor renders obvious the recited combinations of "... compare copy function attributes of each copy function for a storage device to copy policy objectives of the copy policy, wherein the copy policy comprises a set of copy policy objectives that correspond to the copy function attributes of each copy function... wherein comparing attributes of each copy function for a storage device to objectives of the copy policy further comprises calculating a difference between at least two of the copy function

attributes, each configured as a numerical value, and corresponding copy policy objectives, each configured as a numerical value, for each of the available copy functions, multiplying each difference by a priority factor to obtain an adjusted difference, summing the adjusted differences for each copy function, and automatically selecting a copy function further comprises selecting a copy function with a lowest sum of adjusted differences.”, in combination with all the other limitations in independent claim 9.

Regarding claims 25, the prior art of record, neither anticipates, nor renders obvious the recited combinations of “... comparing copy function attributes of each available copy function to corresponding copy policy objectives of a predefined copy policy, wherein the copy policy comprises a set of copy policy objectives that correspond to the copy function attributes of each copy function, the copy policy objectives comprising at least two of a recovery point objective, a recovery time objective, a location, a consistency, and an application impact... wherein comparing attributes of each available copy function to corresponding objectives of the predefined copy policy further comprises calculating a difference between at least two copy function attributes, each configured as a numerical value, and corresponding predefined copy policy objectives, each configured as a numerical value, for each of the available copy functions, multiplying each difference by a priority factor to obtain an adjusted difference, summing the adjusted differences for each copy function, and automatically selecting a copy function that satisfies the predefined copy policy further comprises selecting a copy function with a lowest sum of adjusted differences.”, in combination with all the other limitations in independent claim 25.

Regarding claims 38 , the prior art of record, neither anticipates, nor renders obvious the recited combinations of "... comparing copy function attributes of each available copy function to corresponding copy policy objectives of the predefined copy policy, wherein the copy policy comprises a set of copy policy objectives that correspond to the copy function attributes of each copy function, wherein the predefined copy policy objectives within the predefined copy policy comprise a recovery point objective ("RPO"), a recovery time objective ("RTO"), a distance to a secondary site where the secondary storage device is stored, a consistency, and an application impact... wherein comparing attributes of each available copy function to corresponding objectives of the predefined copy policy further comprises calculating a difference between at least two of the copy function attributes, each configured as a numerical value, and corresponding predefined copy policy objectives, each configured as a numerical value, for each of the available copy functions, multiplying each difference by a priority factor to obtain an adjusted difference, summing the adjusted differences for each copy function, and automatically selecting a copy function that satisfies the predefined copy policy further comprises selecting a copy function with a lowest sum of adjusted differences.", in combination with all the other limitations in independent claim 38.

Dependent claims 2-7, 10-15, 18-23, 26-31 and 39 are allowable at least for the reasons recited above as including all of the limitations of the allowable independent base claims upon which they depend.

13. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

DIRECTION OF FUTURE CORRESPONDENCES

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yaima Campos whose telephone number is (571)272-1232 and email address is yaima.campos@uspto.gov. The examiner can normally be reached on Monday to Friday 8:30 AM to 5:00 PM.

15. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571) 272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 10, 2010

/Yaima Campos/
Examiner, Art Unit 2185

